

Work with hydrofluoric acid requires special care. The Iowa State University Chemical Hygiene Plan has prescriptive requirements for work with chemicals.

KNOW THE HAZARDS OF THE MATERIALS YOU ARE USING.

HF USERS AT AMES LABORATORY ARE REQUIRED TO COMPLETE “HYDROFLUORIC ACID TRAINING” (AL-134) PRIOR TO WORKING WITH HF.

All research activities at Ames Laboratory require approval by the Safety Review Committee. The procedure used for this approval is **READINESS REVIEW**. Make sure the activity you are working on has been approved via the Readiness Review procedure and that you are authorized to be performing work. Ask your supervisor.

Here are some general recommendations for work with hydrofluoric acid:

Personal Protection

Eye protection: Transparent face shield. Acid-resistant plastic splash goggles (glass will become etched).

Gloves: Neoprene or rubber with long gauntlets.

Ventilation: Use in a hood with at least 100 fpm face velocity.

Respirator: Use a NIOSH-approved respirator with an acid mist cartridge. Consult with ESH&A for appropriate equipment.

Clothing: Rubber apron and rubber sleeve guards. Rubber boots are recommended due to the corrosive nature of HF to leather.

First Aid

HF BURNS ARE SEVERE and are often not immediately noticed. First wash affected area with large amounts of water. Water will not penetrate as well as hydrofluoric acid.

Contact Occupational Medicine, G11 TASF, for immediate treatment of HF burns.

Handling Precautions

- ✘ **HF is corrosive.** Take all necessary precautions to prevent corrosion of equipment.
- ✘ All HF work should be done in a hood.
- ✘ All equipment that comes in contact with HF should be thoroughly washed with water immediately after use.
- ✘ Hydrofluoric acid should **NEVER** be used in glass containers.
- ✘ Contact with metals may cause the release of hydrogen gas which is a fire or explosion hazard.

Health Hazards of HF

- Ⓢ Fluoride ions readily penetrate skin and tissue which may destroy subcutaneous tissue.
- Ⓢ Exposure to the vapors will cause respiratory damage.
- Ⓢ HF burns take a long time to heal and results in significant scarring.
- Ⓢ Absorbent clothing can hold HF in contact with skin for extended periods of time. Wear the proper protective clothing.

Storage/Disposal

Store in an HF-resistant container in a cool, dry location.

Hydrofluoric acid is a RCRA listed waste in addition to being a characteristic corrosive waste. Contact ESH&A at 4-2153 for appropriate waste disposal procedures.

Spill Remediation

Small hydrofluoric acid spills should be neutralized with soda ash and washed with large amounts of water.

Large spills of HF should also be neutralized with soda ash. An inert absorbent can be used to soak up the spilled material. The collected waste will need to be treated as hazardous waste.

Equipment that has come in contact with HF should be neutralized with soda ash and rinsed with large amounts of water.

Contact ESH&A at 4-2153 for assistance in spill remediation.

Notify you supervisor of any spill that has occurred.

Hydrofluoric Acid

Physical Properties

CAS #	7664-39-3
Formula:	HF
Synonyms:	Fluohydric Acid
Molecular Weight	20.01
Appearance:	Colorless, Fuming Liquid
Solubility:	Miscible in Water
Density:	48%, 1.150
Boiling Point:	48%, 108°C
Shipping Description:	Hydrofluoric Acid Corrosive, Poison, 8, UN1790
RCRA:	U134

NIOSH: Recommended Exposure Limit (REL), 8-hr TWA 3 ppm, 2.5 mg/m³

Odor Threshold 0.04 ppm.

References

Manufacturing Chemists' Association, Inc., Chemical Safety data Sheet SD-25, Hydrofluoric Acid (Anhydrous and Aqueous), Washington, D.C., 1957.

Beesinger, D.E. and H.R. Mancusi-Ungaro, Jr., *Dealing With Hydrofluoric Acid Injuries*, Industrial Chemical News., July 1983, p. 34.

Department of Energy, Environment, Safety, and Health, *Hydrofluoric Acid Burn: Misleading Latent Period Was Key Factor.*, Serious Accidents, October 1986, No. 12.

Merck Index, 11th ed., Abstract 4717.

Handling And Use of Chemicals, Hydrofluoric Acid In CRC Handbook Of Laboratory Safety, 3rd ed., Furr, A.K., Ed., CRC Press, Boca Raton, FL., 1990., p. 295.

National Safety Council, *Hydrofluoric Acid* (Aqueous), Data Sheet I-459-Rev., 86 Chicago, IL., 1986.

HANDLING OF HYDROFLUORIC

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Not intended to replace the Material safety Data Sheet